

Amended Claims

What is claimed is:

1. A process for producing gasoline, kerosene and diesel oil from waste plastic, rubber or machine oil, characterized in:

(1) Adding quartz and sand into the waste raw materials, including waste plastics or materials containing waste plastic, waste rubbers and machine oil, then catalytically cracking the mixture in a cracker at a cracking temperature of 50-480℃;

(2) Further catalytically cracking the gas fraction obtained in step (1) in a fixed bed to obtain an oil stream, in said fixed bed, the cracked gas is first gotten rid of impurities through a coke layer in a thickness of 20-50 cm, then successively passes through a Pall ring layer, a sorbent layer and a catalyzer layer with 5Å molecular sieves as the catalyzer;

(3) Filter said oil stream in a packed tower to adsorb impurities, then fractionating said oil stream and collecting the fractions of gasoline, kerosene and diesel oil, respectively;

(4) Treating fractions of gasoline, kerosene and diesel oil, respectively.

2. The process according to Claim 1, wherein, in step (1), said quartz is added in an amount of 0.3-1.5% based on the weight of the cracking feed, and said sand is added in an amount of 0.1-0.5% based on the weight of the cracking feed.

3. The process according to Claim 1, wherein, said cracking temperature in step (1) is gradually increased.

4. The process according to Claim 1, wherein, during the fractionating procedure in step (3), a mixture of cobaltic phthalocyanin sulfonate, NaOH and H₂O₂ is added every 5-8 hours, said mixture containing: 200ppm of water solution of cobaltic phthalocyanin sulfonate just obtained by dissolving cobaltic phthalocyanin sulfonate in water; 1.5kg of 10% NaOH; 3‰ of 10%H₂O₂ calculated on the basis of the volume of 10% NaOH.

5. The process according to Claim 1, wherein, in step (3), the fraction from the top part of the fractionating tower, where the temperature is 195-198℃, is a gasoline fraction; the fraction from the middle part, 200-230℃, is a kerosene fraction; and the fraction from the bottom part, 300-360℃, is a diesel oil fraction.

6. The process according to Claim 1, wherein, the gasoline fraction is

condensed at a temperature of 160-180°C; the liquid fraction returns back to the fractionating tower and the gas fraction is condensed again until the temperature reduces to 30-60°C, followed by a sedimentation to separate the oil and water, and the oil is filtered, then treated at a temperature of 30-50°C in the existence of active kaolin in an amount of 1-5% based on the weight of gasoline

7. The process according to Claim 1, wherein, the diesel oil fraction is treated, during said treating process, 98% H_2SO_4 is added in an amount of 2-5% based on the weight of the diesel oil fraction to proceed an acid washing, then 96% NaOH is added in an amount of 1-3% based on the weight of the diesel oil fraction to proceed an alkali washing, and finally a cetane additive is added in an amount of 1-5% based on the weight of the diesel oil fraction.

8. The process according to Claim 1, wherein, waste plastics or materials containing waste plastics are used for producing gasoline, kerosene and diesel oil, and said cracking in step (1) is at a temperature of 60-460°C.

9. The process according to Claim 1, wherein, waste rubbers are used for producing gasoline, kerosene and diesel oil, and said cracking in step (1) is at a temperature of 80-480°C.

10. The process according to Claim 1, wherein, waste machine oil is used for producing gasoline, kerosene and diesel oil, and said cracking in step (1) is at a temperature of 50-380°C.

11. A device for producing gasoline, kerosene and diesel oil from waste plastic, rubber or machine oil, comprising in turn a cracker, a fixed bed, a packed tower, a fractionating tower, the top part of said fractionating tower connecting with a gasoline quencher via a tube, and said quencher connecting to a condenser, said condenser linking to a separator of oil and water, a filter and a gasoline treating column in series, said gasoline treating column being connected with a filter and a product tank in series; the middle part of said fractionating tower connecting with a condenser, a separator of oil and water, a filter and a kerosene treating column in series, and said kerosene treating column connecting a filter and a product tank in series; and the low part of said fractionating tower connecting with a condenser, a separator of oil and water, a filter, and a diesel oil treating column in series, said diesel oil treating column connecting to a filter and a product tank in series; the bottom of said

fractionating tower connecting to the cracker via a tube.